Hard shells and slate	15 to 1665
Hard shells	5 " 1670
Sand and pebbles	8 " 1678
Slate and shells	82 " 1760

Drilled dry. Cased	450′
Conductor	15′
Salt water in slate	445 to 540′
" " red rock	1528 to 1535′
Smell of oil reported in sand	1670 to 1678′

The Olean Conglomerate is probably represented in the record by the sand from 30 to 85 feet below the top of the well.

The records of the Bear Creek and Silver Creek Wells are invaluable as having a direct bearing upon the probable existence of petroleum to the south and south-east of Wilcox.

It will be noticed that the mass of the red rocks are some 300 feet lower in the the Bear and Silver Creek Wells than in the Wilcox Wells, estimating from the bottom of the Olean Conglomerate.

The question as to whether the mass of red bands in the two localities are the same and whether the strata included between them and the Olean have thickened to the south and south-east, is extremely suggestive.

Note.—The records are published just as they have been reported to me. I have not even altered the phraseology, which is quite different in a number of places where the same idea was evidently intended to be conveyed.

I will merely add, for those who are unacquainted with the terms employed by the drillers, that "shell" means any hard stratum encountered in the well, and not, as might be supposed, a fossil.

Nature's Reforesting. By Eli K. Price.

(*Read before the American Philosophical Society, September* 20, 1878.)

The paper on *Sylviculture* read in November and December, 1877, has produced the following confirmatory letters of views therein expressed. They are from the present Chief Justice of Pennsylvania, who lives in Beaver, and the Professor of Botany in the University of Pennsylvania, formerly a resident of Mifflin County, Pennsylvania.

Continental Hotel, February 11, 1878.

My Dear Sir:—I have read the address you sent me on *Sylviculture* with great interest, especially as some of its facts have come under my own observation. The western part of Pennsylvania was once among the best wooded portions of it, yet the destruction of timber has plainly affected

springs and streams. Many of the springs have become wet weather water courses, while the floods in the streams rise suddenly and high, and subside as quickly; the rainfall running rapidly over the denuded surface, and failing to penetrate it, as when shaded by the forest, and covered with leaves and weeds.

There is a curious fact I have never read of, yet which displays the effort of nature in the spread of vegetation. In July, 1837, I returned home from the Constitutional Convention, which sat in Harrisburg. When passing along the canal in the valley of the Juniata, I noticed long reaches of stone covered mountain sides, bare of all vegetation from base to summit, and of most curious structure, the stones being, apparently, comminuted rocks, so small and flat as to have come to a regular inclination at angles, varying probably from twenty-five to forty degrees. After I began to come to that city to the sessions of our Court, passing upon the Pennsylvania Railroad, I occasionally looked for some of these naked stone mountain sides without seeing them. At first I supposed this to be accidental, my attention happening not to be drawn to them at the proper time. In the course of time I began to think I was mistaken, and that these bald spots had disappeared. I was led to look more closely and continuously, and saw a few left, but greatly diminished in extent, and some mere dots between growing trees. At last I discovered mountain sides covered with a very small growth of trees, mere shrubs in size. The last time my attention was given, I saw one large space of mountain side covered with the small flat stones before described, and in it here and there a single sapling or shrub or two standing alone, proving that from leaves or other vegetable matter deposited by the winds, soil had begun to be formed, and vegetation to grow. From what I have noticed of other stony mountain sides covered with large timber, along the same valley, I conclude that there was a time when all these mountains were similar rocky, and stony surfaces, bare of all vegetation, and left by the convulsions of nature just as she cast them up.

I am very truly yours,

DANIEL AGNEW.

Hon. Eli K. Price.

Beaver, August 26, 1878.

My Dear Sir:—On my return by the Pennsylvania Railroad last week I discovered at several places the evidence of the fact I stated to you last winter in regard to the growth of timber on the bald stony surface of the Allegheny Mountains. I am now perfectly satisfied of the truth of my suggestions. I saw distinctly the remaining uncovered surface as of comminuted stone in patches small and great, the young growths of shrubs and sapling interspersed, with here and there one shrub in a bare patch, indicating the beginning of covering and the different stages of progress.

The first point I noticed was about seven or eight miles west of Mifflin —the second at 161st mile *to* Pittsburgh—the third at 152d mile *to* Pitts-

burgh—the fourth 140th mile *to* Pittsburgh, and the fifth just east of the Spruce Creek Tunnel.

An examination of these places I have no doubt will show them to be constantly arising.

Yours Truly, &c.,

DANIEL AGNEW.

Hon. Eli K. Price, Philadelphia, Pa.

West Chester Co., Penna., August 29, 1878.

My Dear Mr. Price:—Your letter was received yesterday. Owing to the work constantly pressing me I have been unable to get away more than four days this summer. During that time I passed (in train) along the line of the Pennsylvania Central Railroad and in the narrows of the Juniata between Mifflin and Lewistown, and my attention was called to the fact that on a number of rocky places all the timber was small and of recent growth. This is at or near the places mentioned by Chief Justice Agnew, and in so far may be regarded as confirming his views, when taken in connection with the fact that extensive and destructive conflagrations appear to be less frequent there than formerly. Being raised in that region, I can remember when for miles the mountain sides each year were a line of fire. Though I have not been there of late years much of my time, I still feel justified in the statement that such events are now of rare occurrence. Fires doubtless do originate each year along the line of the Railroad, but they do not appear to spread far and wide as before.

Touching the motion of the rocks as preventing growth; I can only give as an instance the old mountain road between McVeytown and Kishacoquillas Valley. This ran through some of the most rocky places in the region, and where the slope was very steep, and indeed almost undermined them on the upper side. For years this road was practically abandoned, at least no work was done upon it. I do not remember the place where the rocks had slidden enough to close the road. Indeed these very places were favorite places of growth for the Purple Flowering Raspberry (*Rubus odoratus*) and the *Hydrangea arborescens*. Motion here must have been very slight.

It is a source of great regret to me that I have not been able to take the time to go into a full investigation of this matter. As it is one of interest, and closely associated with my line of work. I believe that the large rocks allowing the snow and rain to find its way readily to a considerable depth have also favored carrying the soil in the same direction (and then away). Professor Hayden alluding to similar places in our western domain, offers this as an explanation of the scarcity of large trees there.

Very sincerely Yours,

J. T. ROTHROCK.

I believe Major Powell in his report, published or about to be published by Government, goes into the question of destruction of forests by fire very fully, and presents the case in a very strong light.

West Chester, Chester Co., Penna., September 3, 1878.

Dear Mr. Price:—Since writing to you I find the following statement in a lecture by Prof. Gray of Cambridge, on "Forest Geography and Archæology" quoting from Professor Shaler of Kentucky—"Professor Shaler from his observations in the border land of Kentucky thinks that there are indications there of comparatively recent conversion of oak openings into prairie, and now since the burnings are over, of the re-conversion of prairie into woodland." The passage in the first part of the quotation refers to Shaler's opinion that fires have destroyed the forests there. This you know is in entire accordance with what is said on pages 276 and 277 of Michaux Travels, published in 1805 (Lambert's translation), of exactly the same region.

Sincerely yours,

J. T. ROTHROCK.

Professor Leo Lesquereaux has formed the opinion that the prairies have failed to produce trees because of a soil inimical to their growth. This theory appears to be successfully combatted by O. P. Hay in the American Naturalist for May 1878, p. 299. It is also contrary to many facts stated in "Sylviculture." The last page of that paper contains the conclusion of O. W. Wight, in his Geology of Wisconsin, who said, "Fire has killed the timber over wide areas, on which grass was growing, exhibiting before our eyes nature's simple method of reconverting woodland into prairie. The reverse process is just as simple. When prairies are no longer swept over by fire, timber springs up, reconverting prairie into woodland. Grass, with fire as an ally, can beat timber. *Timber can beat grass, when it has no fire to fight.*" We may also add that without fire to fight it can conquer stones and root itself beneath the rocks, and be anchored all the stronger. It is ever man that is the great destroyer, and he is competent to repair his own devastation.

Contributions from the University of Pa., No. XV. Preliminary notice on Chromometry, a new branch of quantitative analysis with the blowpipe.

By Professor George Aug. König, Ph. D. With a plate.

(*Read before the American Philosophical Society, Oct.* 4, 1878.)

In a former paper presented to the Society (Proceedings Vol. XVI., January, 1877), I described a colorimetric estimation of titanium. Mention is made in that paper of the interference with accurate results by the pre-